GRASS! GRASS! GRASS!

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THE BEST MODE OF

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OLD PASTURES.

Also, the Second Edition,

ON THE BEST

Grasses for Alternate Husbandry.

And also, the Fifth Thousand,

ON THE

BEST MODE OF LAYING DOWN LANDS

TO

PERMANENT GRASS.

BY WILLIAM BARRATT,

ST. JOHN'S, WAKEFIELD.

BEING PAPERS READ BEFORE THE WAKEFIELD FARMERS' CLUB, AND ORIGINALLY PRINTED AT THEIR EXPENSE.

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OBSERVATIONS

ON THE BEST MODE OF

LAYING DOWN LANDS

FOR

PERMANENT GRASS:

BEING A PAPER READ BEFORE THE

WAKEFIELD FARMERS' CLUB,

MARCH 1, 1844,

BY WILLIAM BARRATT,

WAKEFIELD.

"AND GOD SAID LET THE EARTH BRING FORTH GRASS."—MOSES.

FIFTH EDITION.

LONDON: LONGMAN & CO.; AND J. RIDGWAY.

1849.

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MINUTE OF THE WAKEFIELD FARMERS' CLUB,
MARCH 1, 1844.

The following Paper, "on the best mode of laying down Lands for Permanent Grass," was read before the Wakefield Farmers' Club, at their Monthly Meeting, held on the 1st of *March*, 1844, and excited considerable interest and discussion. The subject of the communication was thought to be of such importance to the Agricultural Interest generally, and so judiciously treated by Mr. Barratt, that the following resolutions were unanimously passed:—

"That the thanks of the Meeting be given to Mr. Barratt, for his very useful, elaborate, and excellent Paper." And "that one hundred copies be printed at the expense of the Club, and that each member have one copy gratis."

HENRY BRIGGS,
Hon. Sec.

OBSERVATIONS

ON THE BEST MODE OF LAYING DOWN LANDS FOR PERMANENT GRASS.

There is no vegetable which, in the wide Garden of Nature, is so profusely and so extensively produced as that of Grass. Indigenous to almost every land, natural to almost every clime, it is found wherever man and the quadrupeds have found a dwelling. While it is the chief thing in that rich and variegated robe with which the Almighty Maker has invested the earth, it is at once the food and the couch of the most useful animals he has given for the service of man. On what objects can the eye of man wander with such ease and delight, as the hill and dale clad in *Nature's green?* On what viands can he regale himself with greater zest and nourishment, than on those his ample pastures have produced?

That this universal and most useful plant admits of improvement by cultivation, the same as any other plant, allows of the fullest proof. On the dreary and interminable plains of New Holland, we have it in a state of nature,—high, rank, and innutritious; in the rich pastures of England, we have it under the hand of cultivation.

But of all plants immediately affecting the subsistence and convenience of man, the cultivation of Grass has been most neglected; indeed we may almost say, that for the most part nature has been left to shift for herself, as far as Grass is concerned; as though this most generous and useful plant were excluded from the operations of agricultural art: yet innumerable experiments have proved that there is scarcely any vegetable production which more surely or more promptly compensates the labour expended upon it when that labour is prudently and scientifically conducted.

It was asserted by Mr. Everett, Ambassador from the United States of America to this country, at the annual meeting of the Agricultural Society, held at Derby, in 1843, "that the whole of our foreign commerce, for the sake of which we cover the sea with ships, and establish our colonies in the most distant parts of the globe, is not equal in value to the Grass of the land." Startling as at first sight this assertion may appear, we concur in its accuracy, and thence infer the *national importance* which attaches to the best processes of cultivation, as it refers to the Grass of the land. Not only is the flesh of animals, both in quantity and taste, influenced by the kind and quality of Grass upon which they feed, but the same cause has a still greater influence upon their natural coverings. The difference in the South Downs and Lincolnshire wools is not so much occasioned by one animal grazing upon a low pasture, and another upon a mountain slope, as it is by the specific difference of the Grasses upon which they feed. If this remark be admitted, it is manifest that our *Woollen Manufactures*, the pride of our country and the blessing of the world, are intimately connected with the subject of our present discussion.

But aside from these more general,—and as some may think them,—speculative views, this question must ever be *important to the farmer*, and for this simple reason, that it must always be the farmer's interest to make the best of his land; of course, to him the *practical* view of the subject is the one, perhaps the *only one*, which can be expected to awaken interest.

It is manifest that the desideratum, the thing to be desired and sought is, *to produce on a given space of land, Grass of the best quality and in the greatest quantity*. But, for the accomplishment of this object, some knowledge and judgment, as well as industry are indispensably required.

I have hitherto spoken of grass as though it was one uniform specific vegetable; a vegetable having the same botanical characteristics in all latitudes and in all localities; and it is not improbable that it is this vague use of the word which has given rise to the ignorant and unthrifty way in which its cultivation is often managed. Let us then, once for all, be undeceived. It were much better to speak of *Grasses* than of Grass, for the great Author of Nature has shown his wisdom and goodness, in the production of many Grasses, most diversified in their forms and habitudes, and qualities and uses; some of these are amongst the most elegant and beautiful things the whole empire of vegetable nature can exhibit! But our present purpose is not to treat of the Grasses in a strictly botanical view, but as connected with agriculture. We have now to do rather with their *uses*, than their *beauties*.

It is then to be recollected that it was not in mere sport that nature produced her two or three hundred varieties of this vegetable, but that each variety is adapted (could the adaptation be ascertained) to some particular locality and use. One kind of Grass flourishes on the low flat land, which withers and perishes on land high and dry; while another specimen, on the contrary, which droops on the marsh, is like an evergreen on the mountain slope—one kind of Grass is vernal and comes with all its succulency, a carpet for the footsteps of spring; another presents its fullest richness in the autumnal months. It is these considerations which make these details necessary upon which we must now enter: and in doing so,—

First.—We observe it is scarcely necessary to say that *Draining* in wet soils is indispensably requisite, not only for producing quantity but quality. Stagnant water is apt to destroy many good kinds of Grasses, and to encourage and promote the growth of inferior ones in their places.

Second.—Land in preparation for sowing down with Grasses, especially for permanent pasture, should have great pains and care bestowed upon it, in extirpating all indigenous weeds, particularly all perennial ones, such as couch grass, dandelion, thistles, crowfoot, or what is vulgarly called butter-cups, thereby impressing the mind with the idea that those are good pastures for producing the best food for milch cows in which there is an abundance of crowfoot, whereas it is a most erroneous idea, it being a strong, bitter, acrid, innutritious plant.

Third.—The form and breadth of the lands may vary, according to circumstances, from three yards to five broad, and nearly elliptical as to form: not, however, raised more than six inches to nine in the crown or highest part of the land. The final operations in laying up the lands should be performed when the ground is dry, so that it may be worked until it presents a fine even surface, otherwise a great number of the smaller seeds will be lost.

Fourth.—Various opinions are afloat as to whether it is best to lay down with or without a corn crop. If a good sward in the shortest space of time be the object sought, it is quite clear it should be without a corn crop. Any profit which may be derived from the corn would be more than overbalanced in the two following years in the crops of grass: yet a sprinkling of barley may be sown, say half a bushel an acre, to form a little shade for the young plants, if the Grasses are sown in spring. If autumn sowing be adopted, the same quantity of rye, or about six pounds of rape per acre, which may be eaten off early in the spring by sheep.

Fifth.—The seasons best for sowing are,—in spring, in the month of *April* or *May;* and for autumn, *August* and *September:* yet Grasses may be sown in any months save *December* and *January*, but not with such certainty of success as the times already named.

Sixth.—Whatever preparation may be made, and however good the condition of the soil, the *sorts* of Grasses on which the quality must depend, is, of course, a most important particular. Promiscuous grass seeds, collected in the usual manner from the hay chamber, cannot be depended upon for forming the best sward in the least space of time, (even though the seeds thus obtained were from fields proverbially excellent in their produce and quality,) for the following reasons:—first, at whatever time the field was mown from which the seeds are taken, it is evident all the kinds of Grasses were not ripe, or some were too ripe, and consequently shook, so that probably three to five sorts of Grasses are the very most you can calculate upon having in the mixture; of *Grasses*, I say, for the probability is, you will have as many or more kinds of seeds of pernicious weeds; nor can you ever produce clean dressed seeds in this way, as the husk or chaff of some kinds is much heavier than the seed itself of others. Again, the field from which the promiscuous seeds are got was perhaps dry ground, and the one you sow them on wet, or *vice versa*. The *pure seeds* in *separate sorts* must be had, and those in their *proper proportions* of each, and *adapted to the specific soil* upon which they are to grow, for these can alone with certainty be depended upon. The suitability of kinds must be ascertained by gathering the best specimens of natural Grasses, and noting carefully down the soil, situation, &c., they grow in; the proportions of each may be ascertained by obtaining a patch of turf from the best pastures, and analyzing it, to ascertain the quantity of each kind of Grass; and, strange as it may appear, within the small space of one square foot of good natural pasture, from eleven to twenty kinds have frequently been found, so that the plan of sowing only two or three sorts, and clovers, must be a slow way of producing a good sward. A clear proof that many kinds of Grasses, on the same space of ground is absolutely necessary, may be gathered from the possibility of improving old pastures by the addition of fresh sorts being sown on to the old sward,—first harrowing the ground to be sown, then sowing the specific kinds of seeds required, giving a slight covering of compost and then rolling it; this may be done without loss of time or going to the great expense of breaking up an old pasture and laying it down afresh. A specimen of this sort may be seen in a field at Clayton West, belonging to Mr William Kaye, which was supplied with the kinds of seeds needed, and treated as thus described; in the same year it was sown, it produced more than double the crop it had done in previous years, at once demonstrating that it was not the fault of the soil, but the deficiency of quantity and defect of sorts of the Grasses.

Seventh.—The nutritive properties of Grasses open to the Farmer a wide field for chemical analysis and one which has hitherto been greatly neglected, as appears clearly from the high estimation in which the *Plantago lanceolata*, or Rib Grass, is held; it is, comparatively, a worthless plant, not yielding one half of the nutriment of many of the pasture Grasses, and yet requiring, from its broad leaves, twice the space to grow in, so that it is not enough to grow quantity, if in a great measure innutritious, but abundance of Grass, yielding the most nutritive feed, is the object to be aimed at,—*good Grass and plenty of it.*

The following scale will give an idea of the relative nutrition contained in a few kinds of Grasses. Upon analyzing these Grasses in spring, they were found to contain the following proportions of nutritive matter, two thousand grains in weight of each kind being tested :—

Agrostis Stolonifera*..producing	48	grains of nutriment.
Alopecurus pratense	104	ditto.
———— geniculatus	89	ditto.
Anthoxanthum odoratum......	64	ditto.
Avena flavescens	76	ditto.
Cynosurus christatus..........	93	ditto.
Dactylus glomerata	88	ditto.
Holcus lanatus	80	ditto.
Festucor elatior..............	96	ditto.
———— arenaria	108	ditto.
———— ovina	106	ditto.
Lolium perenne	78	ditto.
——— Italicum	82	ditto.
Phleum pratense	86	ditto.
Poa pratense................	78	ditto.
— fertillis	74	ditto.
Plantago lanceolata, or *Rib Grass*	43	ditto.

Eight.—But a good sward should have a proportion of early, middle, and late sorts, for want of which we often see pastures fine and fresh early in spring, but bare and brown through summer and autumn, although not arising from burning sun or shallow soil; and in autumn, some kinds of Grasses serve *only* for an early bite,—others, which are bare and late in pushing, but grow full and fresh, indeed a selection of sorts might be made which would be at maturity for mowing three weeks earlier than the generality of fields are, but the sorts forming this mixture are not sufficiently nutritious to be sown alone; other kinds grow through the summer and autumn, so that to insure a good grazing pasture there must be a proportion of these; further, it is a fact that some kinds of Grasses give a much greater crop one season than they do in another, so that a field one year presents a fair proportion of a certain kind, and perhaps the next season little of it is to be seen; but this does not arise from the plants of that kind dying, as some persons have supposed, but the season not suiting them, they lie dormant, or nearly so, until a time congenial to their growth arrives.*

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* The English names are given afterwards.

Ninth.—From these facts we see the necessity of laying down Grass Land with seeds clean-dressed; by this I do not mean such as are merely cleanly sifted, but the chaff all removed and the seeds, as cleanly dressed as any kind of garden seeds, and also saved in *separate* sorts, without which it is utterly impossible to give the proportions proper to constitute a mixture in the field. Although many of the grass seeds are exceedingly small, yet this desirable point is attained; samples of about thirty kinds I have the pleasure to present on this occasion for your inspection, and let it be distinctly understood, that these samples are not extra dressed for the occasion, but just taken from the stocks already housed and ready for sowing this season. Some of the best kinds of Grasses, with a brief description of each, are as follow; I have not yet named Clovers, although they may be classed under the head Grasses:—

---

* For spring and summer, the following sorts form the chief produce:—Smooth-stalked meadow grass, No. 20; Rough ditto, 21; Sweet vernal Grass, 4; Meadow, fox-tail, 2; Round-headed cock's-foot, 7; Cat's tail or Timothy Grass, 19; Tall Oat Grass; Creeping Vetch; Meadow Fescue, 29; Sheep's Fescue, 13; Rye Grass Russel's, No. 16; Italian Rye Grass, for temporary pastures, 18.

For summer and Autumn:—Yellow Oat Grass, No. 5; various Fescue, 9, 10, 11, 12, 13: Crested dog's tail, 6; Perr red clover, 27; White clover, 26.

For Autumn growing:—Creeping Bent, No. 1; Achillea millefolia, 28; Giant's cock's-foot, 22; hard Fescue, 11; Ray Grass evergreen, 17; Poa fertillis, 24.

The numbers attached here refer to the list given in the ninth division.

1. *Agrostis stolonifera*,—Bent Grass.—Suited to peaty moors or tenacious clayey soils. Flowers in May.

2. *Alopecurus pratensis*,—Meadow Fox-tail.—A good pasture Grass, early in growth; bears cropping by cattle well, as it soon springs again; suited to a medium soil. Flowers in May.

3. *Alopecurus geniculatus*,—Jointed Fox-tail.—Suited to watery marshes, but not peat soil; a good Grass for land which is occasionally overflowed with water. Flowers in May.

4. *Anthoxanthum odoratum*,—Sweet vernal grass.—It is from this principally that the fine scent is given to new hay; forms a good bottom Grass, and greatly assists the produce of after-grass or fog, grows well on almost any soil. Flowers in the middle of April.

5 *Avena flavescens*,—Golden oat Grass.—Suited to high dry land; is a very fair Grass for either pasture or hay. Flowers in the middle of May.

6. *Cynosurus cristatus*,—Crested Dog's-tail.—This Grass grows on almost any soil, but thrives best on dry land, although it is sometimes found on irrigated meadows. Cattle do not eat the seed-stalk, but are very fond of the leaves; it forms a better pasture than Hay Grass. Flowers at the end of June.

7. *Dactylis glomerata*,—Round-headed Cock's-foot.—This is a very useful kind of Grass, both for hay and pasture; although perennial, it will not last in land kept under *continual* pasture more than five to seven years. It is fullest of saccharine matter when full grown, but is very useful in after-grass, as it is the very first Grass to grow after being mown; will thrive well in shady ground or in fields lying directly to the north aspect. Flowers in May.

8. *Holcus lanatus*,—or Woolly soft Grass.—Suits wet marshes, but where any other Grass can be produced, this ought never to be sown, as it makes neither good hay, nor is it liked in pastures by cattle. Flowers in July.

9. *Festuca elatior,*—Tall fescue Grass,—is a tall, free growing plant, suits marshy or damp ground, and notwithstanding its coarse appearance, is an excellent Grass for hay, and in pastures is much liked by cattle. A judicious introduction of this into suitable meadows, would be attended with advantages to the Farmer. Flowers in June.

10. *Festuca heterophylla,*—Various leaved Fescue.—On low lands this is a fine meadow Grass. Flowers in June.

11. *Festuca duriuscula,*—Hard Fescue.—This is a kind richly deserving of extensive culture; thrives on most soils; gives a great abundance, when its dwarf habit is considered. The winter's frost or summer's sun seems not to affect or hurt it, like most other Grasses; good for sheep pasture. Flowers in the latter part of June.

12. *Festuca arenaria,*—Sand fescue Grass.—Possesses all the properties of the last sort, with the additional recommendation that it will thrive in high light sandy grounds, where few Grass will thrive. Flowers in May.

13. *Festuca ovina,*—Sheep's fescue Grass.—Does not give produce equal in quantity to the two last, yet it grows well on high moor ground, and is particularly liked by sheep. Flowers late in May.

14. *Lolium perenne,*—Perennial Rye or Ray Grass.—Is a good Grass for alternate husbandry; will grow well on most soils; will give abundance of produce, and when sown along with clover for a sheep pasture should never be allowed to grow to a great height before the sheep are turned upon it. Flowers from June to the end of July.

15. *Lolium perenne variety,*—Pacey Rye Grass.—Is more suited to permanent pasture than the last kind.

16. *Lolium perenne var,*—Russell Ray Grass.—Yields a greater bulk of crop than No. 14 or 15, and grows earlier and later.

17. *Lolium perenne var,*—Devon Ever Grass or Evergreen Ray Grass.—Does not yield so large a crop as No. 14, 15, and 16, but grows all winter, and is the most suitable where sheep breeding is carried on.

18. *Lolium Italicum,*—Italian Rye Grass.—Arrives soonest at maturity of any kind of Grass; where it is cultivated for hay, two crops may be had in one year, but it sooner wears out when this plan is adopted; but where it is sown with two or three others, it forms the best pasture, and is decidedly the best Grass for alternate husbandry. Whatever prejudices this Grass may have had to contend with, they are now fast dying away, and numerous testimonies, the most favourable, are borne by extensive and talented Farmers to its merits. Flowers in May or June, and if mown early, again in August or September.

19. *Phluem pratense,*—Cat's-tail or Timothy Grass.—A good Grass for moist soils and moor lands, and is coming into extensive cultivation. It is a grass, if allowed to grow to ripen its seed, that possesses double quantity of saccharine matter to almost any other Grass in that state. Flowers late in June.

20. *Poa pratensis,*—Smooth-stalked meadow Grass.—This is a good spring Grass, but is not fit to sow any where but on a very dry soil. Flowers in the beginning of June.

21. *Poa trivialis,*— Rough-stalked meadow Grass.—Suited to damp soils; grows very early in spring; suffers when the weather becomes hot, but grows freely again in autumn. Flowers at the end of June.

22. *Dactylis glomerata gigantea,*—A superior sort of Cock's-foot, raised by Mr. Booth of Hamburg. Flowers late in May.

23. *Festuca elatior gigantea,*—Of a superior variety, No. 9, raised by Mr. Booth. Flowers in June.

24. *Poa fertilis,*—Fertile meadow Grass.—Suited to rich moist meadows, producing abundance of late Grass. Flowers early in June.

25. *Poa nervata,*—Nerved seeded meadow Grass.—Grows in medium soils, requires rich land, and produces long leafy stems. Flowers late in June.

26. *Trifolium repens,* or White Clover, is too well known to need any observation.

27. *Trifolium pratense perenne,* or Perennial red Clover, is a very valuable acquisition in pastures. This is often confounded

with Cow Grass; the difference is principally in the duration of the plants,—Cow Grass will continue for a few years, whilst Trifolium pratense perenne will last as long as any of the perennial Grasses. It will grow on almost any soil, and is frequently found on moor land.

28. *Achillea millefolia*, or Thousand-leaved Yarrow, is very desirable in sheep pastures, and will grow in any, even the most barren soil. Sheep are particularly fond of it; it also possesses medicinal properties, which no sheep pasture should be without. It is said by some extensive sheep breeders, that sheep which graze in pastures where this abounds, are seldom infected with *the disease* called *the Rot.*

29. *Festuca pratense*,—Meadow fescue.—A nutritive Grass, liked by horses and cattle; grows early, but is late in flowering. Flowers in the middle of June.

30. *Poa nemoralis sempervirens*,—Hudson's Bay meadow Grass. Has not been long introduced into this country; keeps its green colour all winter; grows early in spring. Good pasture Grass, as it shoots freely again, after being cropped off; grows well in the shade, and is well calculated for orchards.

There are many other useful sorts, which are necessary in the various kinds of meadows and pastures.

Tenth.—The different proportions of each kind of seed vary very much according to the soils, situations, and aspects they are to grow upon, and the uses they are intended for. Several eminent agriculturists have given tables, stating the different kinds and quantities for each class of soils, but all of these gentlemen agree that it is next to impossible to do this in general terms, as the various designations of light soils, medium soils, and heavy soils, are rather ambiguous terms, or at least they do not convey a description sufficiently accurate to enable general lists to be given. *Practice alone* can decide this.

Eleventh.—The beneficial effects of sowing down with clean seeds, suitable kinds, and a sufficient number of sorts, appear in the production of a good sward in some years of time less than can be done by promiscuous seeds, or by sowing Ray Grass and

Clovers, leaving the ground to be filled up by the slow process of natural Grasses arising, which must take many years to furnish an ample supply.

Twelfth.—In sowing, great attention must be paid to give every part of the surface an equal quantity of seed, and the several kinds of seeds in correct proportions. This will be best effected by mixing such sorts of seeds together as are nearest to each other in size and weight; and so, by several sowings, to equalise the whole. Care should be taken to sow on a still day, and with the ground tolerably dry, otherwise, in the process of rolling or harrowing the seed in, much of it will be displaced or destroyed, by clinging together with the wet soil.

Thirteenth.—The best mode of depasturing the first crop is of some consequence: there are weighty reasons to be assigned against its being grazed, except in alternate husbandry, or where it is laid down temporary. For permanent pasture, it is very desirable to mow the first produce, taking especial care to let the crop get fully ripe, before the scythe is applied; although the hay, by this plan, will be deteriorated, yet the seeds which will be cast upon the ground will repay that loss tenfold. But a still more important end is, the plants of Grasses thus treated will have a much more vigorous habit, and yield far greater crops for years to come. It is fallacious to suppose that we do no harm by stripping off the leaves of perennial plants in the first season of their existence, and in nothing is such a practice more mischievous than in Grasses.

Fourteenth.—The treatment of pastures the first season demands some little thought. When the Grasses are grown about three inches high, it is well to roll them with a light roller; again, after the first mowing, roll well with a heavy roller, three or four times over as soon as the hay is removed, and if the ground is very dry, weight the roller, and go once or twice more over it. Then give a light sprinkling of compost; it is not of much importance whether it is rich or not: even common unmixed earth would be far better than that it should not have any thing put upon it. The aftergrass or fog would be best eaten off by sheep or young calves, but by no means should foals or young horses be allowed to be upon it. In the following February or March, or earlier if the fog is well eaten off, give a good covering of rich compost or dung.

Fifteenth.—In April, or early in May following, the weeds should be all pulled out, and although this may seem a needless trouble and expense, it is not so, and the time is approaching when agriculturists will be as careful and persevering in extirpating weeds from their new sown pastures for the first and second years, as they now are in cleaning their turnip fields by the hoe. A single thought on this part of my observations must show, that better grass and more of it will thus be obtained, especially if, after weeding, there be a sprinkling of seeds on the bare places, should there be any, and then dreize or bush-harrowing over the field; after this, use the roller, and that a heavy one, very freely.—Pasturing or mowing as the wish or convenience of the parties may be, is a matter of no moment.

Sixteenth.—I cannot bring these observations to a close without again adverting to the *national importance* of this, as well as every other department in the practice of agriculture. I do not wish to be understood to say that grass land, by any process of culture, can be made to produce the means of human subsistence equally with arable land; but I do mean to affirm, that the cultivation of Grasses upon the best principles, will go far to multiply man's food; and, as far as it goes in this respect, it will go to settle in the very best way, that is *practically*, that question which has so long and so deeply agitated our country,—I mean the Corn Law question! Could the practical genius and the spirit of enterprise, which carried into the Manufactories and commerce of our country, have made her the admiration and the envy of the world, be equally brought to bear upon her agriculture, many years would not pass away before *Corn* and *Cattle* would be numbered amongst our *exports* instead of our *imports*; and that indeed were a proud way of disposing of the question so vexatious and so injurious to the peace and amity of our native land. In the calculations of political economists, and in the speeches of political orators, the natural fertility of our native soil has either been lost sight of, or ungratefully depreciated. England is not a barren island, unrequiting the labour expended upon it, as some of the speculators of the day would have us to suppose; it is a *generous soil.* What though it yields not the vine, the fig, or the orange tree, it yields what, for the use of man, is incomparably better,—*Corn* and *Grass!* It is indeed true that our hedge rows are not enriched with the peach, the apricot and the pomegranate; but it is equally true, that the *Ox*, fed in the pastures they enclose, has not its rival in the world. As a people we may be content to fetch our dessert across the Atlantic, or from the shores of the Mediterranean; but our *first*, our *substantial* dishes,— our *mutton* and *beef*,—we fetch from our own fields.

To some persons it may appear a species of trifling to say so much on the cultivation of Grasses, but it will not appear so to those who have duly considered the climate and soil of this island. The *soil*, the temperate climate, and especially the frequent showers of England, are so favourable to the growth of Grasses, that to the eye of a Spaniard or Asiatic, our country is like one vast evergreen adorning and enriching the silver sea! To neglect, therefore, the cultivation of Grasses, is to overlook the leadings of nature, and to lose the prime advantage of soil and climate.

If the oft-repeated maxim be true, "that he who makes a blade of grass grow where one never grew before," is a friend to his species, that man cannot be doing otherwise than good who makes two, or even half-a-dozen blades, and those of higher nutritive qualities, to grow where only one has previously grown; and to effect such purpose *(whether successful or not)* has been the design of this paper.

THE END.

T. MICKLETHWAITE, PRINTER, JOURNAL OFFICE, WAKEFIELD.

OBSERVATIONS

ON THE

SELECTION AND CULTIVATION OF GRASSES IN ALTERNATE HUSBANDRY,

BEING A PAPER READ BEFORE THE

WAKEFIELD FARMERS' CLUB,

JULY 26, 1844.

BY WILLIAM BARRATT,

WAKEFIELD.

SECOND EDITION.

WAKEFIELD:
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1849.

MINUTE OF THE WAKEFIELD FARMERS' CLUB,

JULY 26, 1844.

At the Meeting of the **Wakefield Farmers' Club**, held July 26th, 1844, at which the following Paper was read, a resolution was passed to the effect :—

"That one hundred copies of Mr. Barratt's Paper, which he has just read, be printed at the expense of the Club, and distributed one to each Member." And "That the thanks of the Meeting be tendered to him for the research he has displayed, and the pains he has bestowed in preparing the same."

HENRY BRIGGS,
Hon. Sec.

OBSERVATIONS

ON THE SELECTION AND CULTIVATION OF GRASSES IN ALTERNATE HUSBANDRY.

While other arts affect the comforts and elegancies of life, that of agriculture is most intimately connected with its very existence. Men might subsist, though perfumes, and silks, and jewellery were annihilated; but without corn and cattle, fruit and vegetables, the nations of men must be no more.

This most useful of all arts, and the parent of every other, has had the best attention of the wisest and most politic nations in all ages. It is not to much to say, that the nations of men must always decline in power and happiness as the cultivation of the earth is neglected. What are those savages, who roam o'er the interminable forests of America, depending for subsistence on the precarious success of the chase? And what are those miserable tribes inhabiting the southern latitudes of Africa, feeding on reptiles and the roots of wild plants, dug with their fingers from the ground? They are the descendants of those races which, either from idleness or the love of rapine, forsook the practice of agriculture, forgetting or neglecting the appointment of Heaven, "that man should till the ground from whence he was taken." Our Anglo-Saxon ancestors, a race of restless and haughty warriors, held agriculture in abhorrence, committed it wholly to their women and slaves as an ignoble and laborious thing, and even enacted laws against engaging in it: but they, in that period of their history, were but barbarians, who in the process of time, by the pinchings of hunger, were taught better sense; and but too much of this spirit has been found in our forefathers—improving views of this long-neglected art are but just dawning upon this land of enterprise and capital.

I would not with the ancient Persians make agriculture a duty of religion, but I have no hesitation in avowing, that no nation is happy, that no nation is secure, where agriculture is suffered to decline. Important as this art is, it has hitherto been beyond any other of the arts shut up from improvement. Age after age, and century after century have rolled away, and men have gone on doing as their fathers before them had done. With the cultivators of the soil, more than with any other class of men, that a thing IS, seems a reason why it should continue to BE. Whether there is something in the exercise of tilling the ground which has a tendency to "freeze the genial current of the soul," I know not, but certain it is that the productions of genius, and the wonders of discovery, have been less frequent in agriculture than any science. The modes of cultivation have been almost as lasting as the hills and valleys which were cultivated! But the age for improvements in the art of agriculture has at length arrived. The spirit of invention and discovery by which the mechanical arts have been so greatly advanced has now reached to husbandry, and more changes—and those changes for the most part improvements—have been effected in matters relating to husbandry within the last ten or twelve years, than were achieved in many previous centuries. The force of genius is beginning to break down the prescriptions of antiquity even in agriculture, and suspicion is awakened that the oldest customs may not always be the best. From the days of our mother Eve, to those of the ingenious and persevering Arkwright, the only method known of making a thread was to draw a filimentous substance, such as flax or cotton, betwixt the human thumb and finger; but Arkwright invented a machine which effected this purpose, and effected it with inconceivably more rapidity, and with no less improvement in the beauty and accuracy of the thread. And what was the consequence? The thumb and finger of all the spinsters in the world were relieved from their tedious toil, that nuisance of a home, the spinning-wheel, was for ever set aside, millions on millions of half-naked human beings were clad, and the commerce of the world was changed. Now, although we may not be able to mention any one improvement in husbandry equally decisive and equally extensive in its effects with the invention we have alluded to, yet since modern mechanics and modern chemistry have been admitted into agriculture, the changes which have ensued are most striking and most important. Need we allude to the almost magical effects produced by *Draining*, the facility given to this by the vast improvements in the art of making Draining Tiles, or the fertility produced by chemical and imported manures? Perhaps it is going too far to say that to the capabilities of the earth in the production of vegetables there are no limits; but that the utmost limits have as yet, even in the most Eden-like spots, been attained, is what we most sincerely disbelieve. Chemistry has at length found its most enlarged, its most noble, its most legitimate field of operation, *i. e.* the *Field* itself, in the powers and process of vegetation! And if our wish might prevail, it should never stop in its enterprise until this earth had become one great garden, or rather, "a field which the Lord hath blessed." These general remarks must be our apology for any observation which may appear new or speculative in what is about to be advanced on the subject of the selection and cultivation of Grasses for alternate husbandry; and we must bespeak the indulgence of the Club, for these somewhat hypothetical statements, on a subject in itself so eminently and peculiarly practical.

In sowing fields of Grasses and Clovers for alternate husbandry, there are some points of importance to be carefully observed, such as,—

The necessary preparation of seeds;
The most suitable kinds;
The various uses they are intended for; and
The duration of crops.

It is obvious to all practical persons, that on the due care in preparing the ground intended to be sown, in a great degree depends the germination of the seeds. As grass and clover seeds are small, the ground ought to be worked tolerably fine; this remark is superfluous where the grounds are naturally of a loose or sandy nature, but in strong loam or clayey soils the utmost care is requisite to make the surface fine before sowing. Many persons sow the seeds directly after sowing their Spring corn, and either harrow or roll the ground over to cover in the same, although it may be very rough and uneven. It would be preferable to leave it to pulverize by the weather for some time, taking the opportunity of a dry day or two to work the ground with a light harrow until its surface is even. The seeds sown on a surface so prepared will not get buried too deep, and consequently will not perish. Moreover, the ground being worked in a dry state it will not be so liable to crack by drought before the corn has made a cover, which is often the cause of death to the young plant.

The most suitable kinds of Grasses and Clovers are those which give the largest weight of produce, and arrive at maturity the earliest; many grasses are excellent in permanent pasture which would not be at all suited to this purpose. At the present day *Trifolian pratense* or *Red Clover* is the most extensively cultivated of any clover or grass for alternate husbandry. In some soils it is easy of culture and scarce ever fails to produce a good crop where the land is tolerably well managed; but in other places, however carefully the ground is prepared and attended to, it proves a partial and sometimes a total failure. I do not allude here to those who in consequence of careless sowing, their seed being either buried too deep or not covered at all, never vegetates, or, if vegetated, it soon dies off—nor to those crops spoiled, or partially so, by strong thickly grown crops of corn, or by the same being laid so as to smother the young plants. I allude to those fields, which, after the corn is reaped, and even through the winter until spring, present a good supply of healthy looking young plants of clover—then die away by large patches, and in some instances nearly the whole field together. Many efforts have been made to ascertain the cause or causes of this failure, but whether it can be fairly traced out remains yet problematical. *By some it has been attributed* to an improper kind of seed, and this much is certain, that the French kind of Red Clover is either but an annual, or is more tender than ours, as it will not live on many of our strong or cold grounds—grounds on which English Red Clover will do well. It is a fact well ascertained that the slugs destroy it in wet ground. *By others the failure is attri-*

buted to want of firmness and closeness in the soil; when the corn plant roots decay after the crop has been cut, they too frequently leave the ground light and loose, resembling honeycomb, which must be hurtful to the young plants of grass or clover. I believe clovers need rolling as soon after the corn is reaped as the convenience of the farmer will admit of, and if the ground is in a tolerably dry state, to roll again in October would be beneficial, and again in Spring, just before the clover puts forth its fresh leaves, and after this collect the stubble which has afforded the young clover a shelter like a piece of netting during the Winter. This observation is grounded on the following facts, viz., even in the most extensive failures of clover, the head lands and near the gateways are seldom or ever known to die away, and to the firmness of the soil rendered so by the extra carting or treading on, I attribute this. Another fact was named by our secretary, Mr. Briggs, at a previous meeting, which corroborates the remarks now made in a very striking manner. The horses of a nobleman were ridden for exercise in a field of young clover, and on the very circle where it was expected they would have destroyed the plants, by incessant treading, was the only place in the field where there were any clover plants left, the others all failed.

By chemical analysis Red Clover is found to contain a great per centage of Potash, which proportion must of necessity exhaust the soil of that particular constituent, and in consequence render the ground incapable of again producing that particular kind of plant for perhaps six or seven years, or until it has had sufficient time to get a fresh and adequate supply of Potash. To remedy this inconvenience, it has been proposed to give the ground a sufficient quantity of Potash, as manure, every third year, in order that Red Clover may be grown trienially; but perhaps a better plan would be (where practicable), to plough two inches deeper when fallowing for the crops on which Red Clover is intended to be sown, affording thereby fresh virgin soil; for on fresh soil, I believe, Red Clover is never known to fail: or, what may perhaps be considered the safest, most simple, and most effective plan, is to sow Red Clover in the same piece of ground only once in six or eight years, and sowing alternately grasses on one fallow crop and clover on the next; this would cause a seven years' rest for Red Clover.

It will not, I apprehend, be out of place here to name, that in partial failures of Red Clover, if Italian Rye Grass be sown on the bare or thin places so soon as the corn is reaped, or in any failing parts in March or April following; it will be fit to mow when the clover is, and also spring again for a second mowing with the second cutting of clover.

For alternate husbandry, *Italian Rye Grass* justly claims a very prominent position; *for quick growth, abundance of produce, and nutritive property,* its like is not known at the present day. Some of the Old Rye Grasses are very properly discarded by many Agriculturists, and the bare mention of Rye Grass grates upon the ears very offensively, but true Italian Rye Grass merits extensive cultivation. An experiment which has been made proves its merits in the produce of hay. It was sown the 4th May, and cut for hay the 15th August, the second cutting was ready for the scythe in October, and was cut for cattle; in the first cutting many stems were near five feet high. In most instances two seasons are all that with any degree of certainty can be depended upon, although instances have occurred of its lasting five or six years; this, however, must be owing to the crops being allowed to perfect their seed, which seed has been scattered, and not the plants originally sown which have had that duration. Besides being a good grass to cut for hay, it is excellent in alternate pasture for both cattle and horses, they are fond of and eat it greedily; the fattening quality of it is far beyond that of any other of the Rye Grasses. So essential is it to sheep breeders, that no sheep pasture should be without it; in an experiment pasture for sheep, it was found that the common Rye grass was permitted to grow and ripen its seed, and even white clover was forsaken by the sheep, whilst Italian Rye grass was kept closely cropped; when a similar experiment was tried on cattle which were kept up at nights, on being turned out in the morning, they were observed to go direct to the part of the field on which it was growing; it grows except in strong frost the whole year round—before other grasses move in spring, it is green and fit for use, and in autumn it grows the latest of any other of the grasses—it is becoming extensively a substitute for Winter Tares.

Festuca elatior.—See No. 9, page 13,* in Grass Pamphlet.—It has not yet attained, but highly deserves extensive cultivation—it soon arrives at maturity—it gives an early and abundant produce in Spring—grows well the whole season,—and after cropping yields a large supply of aftermath or fog.

Festuca loliacea,—Darnel fescue.—A fine free growing grass, soon gets to perfection, possesses valuable feeding properties, yielding a greater weight of produce than Perrenial Rye Grass, to which it bears a strong resemblance, possessing all the good properties of that grass, and none of its defects.

Dactylis glomerata,—Round headed Cock's-foot or American Orchard Grass. Although not possessing every excellence, has many good properties; it has a greater variety of merits than any other grass, it quickly arrives at maturity, bears frequent cropping well, affords a great weight of produce, and its nutrition is considerable. The coarse appearance it makes, and the tufty manner of its growth have been urged as objections to it, but when sown thickly or a sufficient quantity of other grasses sown amongst it, these objections are proved groundless; and more fully so, when we take into account the early and certain supply of most nutritious herbage through the season; indeed, the more its merits are fairly tested, the more will it become a favourite grass for alternate husbandry. (See No. 7, page 12, on Pasture Grasses.)

Phleum pratense,—Cat's-tail or Timothy Grass.—(See No. 19, page 14, in grass pamphlet).—This grass like many other strong growing kinds is improved by being sown thickly.

Medicago lupulina,—Yellow non-such trefoil.—This plant produces a good supply of rich sweet food for sheep pasture, it has been used as tillage, by plowing in the crop when in full bloom, and used in this way has produced a fine crop of wheat; it is best adapted for light soils and alternate husbandry, as it is but a biennial plant.

Poa pratensis and trivialis,—Make good bottom grasses for sowing in alternate husbandry. (See grass pamphlet).

* The references to grass phamphlet, is the one I published on permanent grass.

Achillea millefolia.—(See No. 28, page 15, in grass pamphlet.)—Is becoming a great favourite with farmers on their grazing land.

White clover, trifolium repens,—The value of this is well known to all farmers, it grows in almost every kind of soil, and in fact few pastures or even waste grounds are without it; perhaps no plant varies so much in size and growth as white clover. In rich soils it flourishes freely, but upon sandy poor soils its growth is so diminutive that it is not perceptible without minute investigation, and this is what has led to so many conjectures and wild speculations about its appearing fine as a sown field immediately after lime, compost, or dung has been spread upon such ground, although no fresh seed has been sown upon it; from this apparent phenomenon we may see the necessity for frequent top dressing in the cultivation of this plant. White clover should not be sown alone even for sheep pasture, as a judicious mixture of the natural grasses, both increases the produce and improves the quality of the pasture as food for sheep.

The importance of a selection of suitable kinds of grasses, will appear, when we call to mind the differences there are in produce of fields, as it respects the quality of milk, butter, and cheese, as well as the fattening properties that others possess, in a striking degree; these circumstances led to the investigation of this subject, and the conclusion is that it is not so much the goodness or richness of the ground which produces the superior quality of the herbage, but the nutritive properties of the various grasses. I venture to suggest the following tables for the various purposes of alternate husbandry grasses, each for one statute acre.

Table I.—For what may be designated a Red Clover crop, in medium soil, for mowing:—12lbs. Red Clover; 4lbs. Festuca elatior; 6lbs. Italian Rye Grass; and 4lbs. Festuca loliacea. N.B.—In very dry soils, add 3lbs. Medicago lupulina;—in wet soils, put 4lbs. Phleum pratense.

Table II.—For an alternate crop of Grasses for one year, where the land fails in Red Clover, for mowing or cattle pastures, by way of a rest from Red Clover, medium soils:—20lbs. Italian Rye Grass; 3lbs. Festuca elatior; 3lbs. Festuoa loliacea; 4lbs. Medicago lupulina; and 4lbs. White Clover. N.B.—In dry soils, add 2lbs. Poa pratensis, and 2lbs. Festuca arenaria;—in wet soils, put 2lbs. Poa trivialis, and 3lbs. Phleum pratense.

Table III.—For two years hay, and pasture in medium soils:—12lbs. Italian Rye Grass; 6lbs. Dactylis Glomerata Gigantea; 6lbs. Festuca pratense; 4lbs.

Alopecuris; 3lbs. White Clover; 4lbs. perennial Red Clover.—N.B.—In dry soils, add 3lbs. Medicago lupulina, and 1lb. Achillea millefolium;—in wet soils, add 4lbs. Phleum pratense.

TABLE IV.—For sheep pasture, for one year:—10lbs. White Clover; 1lb. Achillea; 4lbs. Italian Rye Grass; 3lbs. Lucern; 6lbs. Festuca ovina; 6lbs. Cocksfoot; 8lbs. Poa nemoralis. N.B.—In dry soils, add 4lbs. Medicago lupulina, and 1lb. Achillea millefolium; in wet soils, add 4lbs. Poa trivalis. If to remain two years, instead of 3lbs. of Cocksfoot, put 6lbs. or 8lbs.; if to remain three years, sow, in the month of April, in the third year, 6lbs. Italian Rye Grass, and harrow it in. If this mixture is sown in autumn without a crop, sow at the same time, 6lbs. of rapes per acre.

TABLE V.—For mowing to give to horses as green fodder; if sown in autumn, for one year:—1½ bus. Winter Tares; 1 peck of Rye; 24lbs. Italian Rye; 6lbs. perrenial Red Clover. This mixture grown on a rich soil has been cut as often as five times in one season, of course, commencing as soon as possible with the first cutting.

The quantity of seeds given in the foregoing tables are made out with the greatest regard to economy, but where one-fourth or even more of each sort of seed be added, the certainty and increase of crop more than repays that expense.

The *weight* of produce is always to be taken into consideration, especially in alternate grasses, along with the nutrition afforded in each. I here submit the results of a few experiments in the weight of grasses, which will still further show the advantages of a careful selection of the kinds to be sown.

TABLE of the WEIGHTS of the various Grasses per Statute Acre, in lbs., cut about the middle of April, or at the time of Flowering, also in Aftermath or Fog.

	April.	Time of Flowering.	Aftermath or Fog.
1. *Agrostis stolonifera*—Bent Grass		18000	3200
2. *Alopecurus pratensis*—Meadow foxtail	8500	20418	8167
3. *Alopecurus geniculatus*—Jointed foxtail		8500	3000
4. *Anthoxanthum odoratum*—Sweet vernal Grass	3400	8720	5000
5. *Avena flavescens*—Golden oat Grass	3600	8500	4000
6. *Cynosurus cristatus*—Crested Dog's tail	3500	6000	2500
7. *Dactylis glomerata*—Round-headed Cocks-foot	9200	27900	11000
8. *Holcus lanatus*—or Woolley soft Grass	4500	21500	6000
9. *Festuca elatior*—Tall fescue Grass		47000	13000
10. *Festuca heterophylla* — Various Leaved Fescue		1600	7500

	April.	Time of Flowering.	Aftermath or Fog.
11. *Festuca durinscula*—Hard Fescue	7500	1800	10000
12. *Festuca arenaria*—Sand fescue Grass		7500	3000
13. *Festuca ovina*—Sheep's fescue Grass		6500	2700
14. *Lolium perenne*—Perennial Rye or Ray Grass	5600	1300	4600
15. *Lolium perenne variety*—Pacey's Rye Grass	5000	14000	5600
16. *Lolium perenne var*—Russell's Rye Grass	5300	15600	6700
17. *Lolium perenne var*—Devon Ever Grass or Evergreen Ray Grass	5000	11000	6000
18. *Lolium Italicum*—Italian Rye Grass	9500	27000	19000
19. *Phleum pratense*—Cat's tail or Timothy Grass	5500	23000	10000
20. *Poa pratensis*—Smooth-stalked Meadow Grass	4000	10000	4000
21. *Poa trivialis* — Rough-stalked Meadow Grass	3000	8000	5000
22. *Dactylis glomerata gigantea*	11000	30000	14000
23. *Festuca elatior gigantea*		51000	14600
24. *Poa fertilis*—Fertile meadow Grass	7000	1460	5000
25. *Poa nervata*—Nerved seeded meadow Grass	8500	22000	9500
29. *Festuca pratense*—Meadow fescue	10002	21000	8000
30. *Poa nemoralis sempervirens* — Hudson's Bay meadow Grass		9500	4200
Holcus mollis—or Soft Yorkshire Grass	10000	32500	17000
Festuca loliacea—Spiked fescue or Darnel Grass		15600	4600
Medicago lupulina—or Yellow Clover		1650	8000
Trifolium pratense medium—or Cow Grass		20500	16400

Note.—The numbers attached to the above refer to the same kinds of Grasses described in my pamphlet on "The Best Mode of Laying Down Lands for Permanent Grasses."

The weights given here are partly from my own observations, but more from practical men with whom I am acquainted, and then compared with the published accounts of the Highland Society, the works of Sinclair, Lawson, and others, and from all these sources as near a medium weight as possible is given.

The importance of this part of our subject, viz., the Weight of Grasses, to Farmers, Graziers, and Cow-keepers, must be evident. The more so, as the plan of mowing fodder for horses, cattle, and milch cows, is coming into more general use from year to year. It is found by experience that the advantages of soiling or stall-feeding over pasturage are very considerable. A field requisite for the support of twenty head of cattle, when used as a pasture, will support thirty-two when the fodder is mown; some experiments in this way shewed a saving of from twenty-eight to thirty-five per cent. Nor is this all: the cattle feed with greater ease, not being so much exposed to flies; and the manure instead of being speedily dried up by the sun and wind, and spoiling for the summer season the herbage on which it falls, is gathered with ease in the folds—the liquid manure being preserved in tanks. By these means a saving of manure of at least forty per cent. is effected; with the additional advantage of being able to apply it WHEN and WHERE it is most required.

It has occurred to me before closing this paper, to take the opportunity, lest another should not present itself, to state in a few words what in my apprehension are those leading points of enquiry, to which the attention of an Association, like the Wakefield Farmers' Club, should be more specially directed; not, indeed, to the exclusion of the minutest subject, such as an improved implement, even the form of a spade, plough, or rake, but, demanding, as I imagine, a more marked and special attention.

The first of these inquiries is,—WHAT SUBSTANCE IT IS IN NATURE WHICH CONSTITUTES THE FOOD OF PLANTS? As that has ever been, so it still remains, the prime question with the Agriculturist; much, indeed, has been done, but much remains to be done in this matter. If man knew the food of vegetables, as he knows the food of a horse or an ox, he could nourish and even fatten vegetables as well. The whole class of manures comes under this enquiry, and the various processes of irrigation, also the doctrine of soils, and the purposes they subserve in the process of vegetation, are subjects in which the mineralogist as well as the chemist may so materially assist the farmer.

The second inquiry relates to THE ADAPTATION OF DIFFERENT VEGETABLES, FRUITS, AND GRAIN, TO THE NOURISHMENT AND ENJOYMENT OF ANIMALS—OF MAN ESPECIALLY? What great advance has been made in this enquiry since men fed on roots and acorns? Attention to this point has, within comparatively a few years, enriched our gardens and fields with new articles of food for cattle, and much pleasant and nutritious diet for man. Who is ignorant of that delightful and salubrious vegetable so plentiful and cheap, a vegetable unknown as an article of food to our ancestors—Rhubarb? Let us not for a moment suppose that we have exhausted nature's treasures in her vegetable province. No: many plants are yet growing unobserved in the depths of the forest, on the lonely isle, on the mountain, or on the marshy waste, which shall hereafter become the food of millions.

The third chief subject of inquiry relates to THE ROTATION OF PRODUCE. The order in which different crops should succeed each other, in different soils and situations; this which is properly the doctrine of "*Alternate Husbandry*," is far from being placed upon known and uniform principles. The great diversity of practice, not only in different ages, but also by different parties in the same age, shows how imperfectly the entire subject is understood.

The last particular I shall mention, as what should form a leading subject for investigation, by an Agricultural association like the present, is—THE RECOVERY OF WASTE LANDS, AND THE RENOVATION OF SUCH AS ARE OLD AND EXHAUSTED. Of the many mistakes made by some of the politicians of the day, none is more obvious than that which represents this Island as over populated. How can that country be over populated whose surface contains such a large portion of land, just in the state in which the deluge and the seasons have left it? Millions of acres in this Island have been plowed only by the waters, and sown only by the winds! Should this sound as hyperbolical to some, it will not to *one* who has travelled much, and made his observations on the face of the country, or who has directed his attention to its statistics.

Statistical account.—The total Land of the United Kingdom is Seventy Millions of Acres, of this about Fifty Millions are cultivated, and about Fifteen Millions more are worthy and capable of cultivation, this would allow Two and a Half Acres each, to every Man, Woman, and Child in the Empire. The present cultivated parts of the Land, produce about £120,000,000 annually; whereas, if the spade husbandry system was introduced, it would produce £1300,000,000. According to this, it would appear, that instead of this Kingdom not being able to support its present Population of Twenty-eight Millions of People, it is capable of supporting ten times that number, in fact, very near the whole of Europe.

If ever capital should come to be freely employed upon the land, it will quickly appear than none need forsake their native soil, either for want of *employment or food.* Nearly connected with the recovery of waste lands, is the renovation of such as by long cultivation and extreme cropping have become spent, whatever that quality in land may be which secures fertility (other things being favourable) to the virgin soil, the restoration of that quality to soils long under tillage, must ever be a *desideratum* with the British Farmer, and, therefore, of the first importance, in the deliberation of a Farmers' Club.

I am not ignorant of the apparent temerity of thus presuming to specify certain lines of enquiry as entitled to the chief and especial attention of this increasing and prosperous society. But the pleasure I should feel in seeing these subjects investigated by master-minds, and under the guidance of a sound and practical philosophy, would more than compensate for all the odium of presumption, should I unhappily have incurred that odium by thus suggesting them to you.

But when we daily see the mighty effects produced by the exercise of the mental energy of man in almost every art and science, we are ready to exclaim, why is the primitive, the rational, the innocent and enriching art of agriculture, left comparatively neglected? Is it because it does not require mental as well as physical energy? That cannot be; for were a man to begin with the earliest dawn of youth availing himself of the experience of his forefathers in this art, and to devote to it the highest talents which fall to the lot of mortals, he might advance in improvements until called hence, and even then leave in agriculture an ample field for the brightest geniuses of succeeding ages. Man, by exerting the powers of his mind, has watched the movements of nature, investigated her laws, ascertained the various properties of bodies, and applied them to his own use. Earth and air, fire and water, are his daily servants. All the mechanical powers, all the chemical affinities, are subservient to him. Metals and salts, acids and alkalies, solids and fluids, elements and compounds, are active in his employ, and made to work his will. The magnetic influence guides him across the ocean, the winds of Heaven waft his merchandise to distant shores, a vapour works his machinery, and a gas lights his streets. His mental energy is perpetually working changes in material bodies ; the unsightly ores are made to assume a thousand useful and brilliant forms. Even the very face of nature is changed. Where the wide forest stretched its leafy and its silent shade, villages and towns and cities appear—hills are levelled, deep vallies filled, and navigable streams guided through the land in every direction to serve the purposes of commercial enterprize; and *Why*, we ask again, why shall not the waste become a fruitful Garden, the neglected moor—fields of Corn, and the wild desert—an ample Pasture?

St. John's, Wakefield, July 1844;
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T. MICKLETHWAITE, PRINTER, JOURNAL OFFICE, WAKEFIELD.

AN INQUIRY

AS TO THE

BEST MODE OF IMPROVING AND RENOVATING

OLD

PERMANENT PASTURES;

BEING A PAPER READ BEFORE

THE WAKEFIELD FARMERS' CLUB,

APRIL 5TH, 1849,

BY WILLIAM BARRATT,

WAKEFIELD.

"THE WHOLE OF OUR FOREIGN COMMERCE, IS NOT EQUAL IN VALUE TO THE GRASS OF THE LAND.—See Everrett's Speech at Derby in 1843.

WAKEFIELD:
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1850.

MINUTES OF THE WAKEFIELD FARMERS' CLUB,

HELD APRIL 5, 1849.

EXTRACT from the Minutes of Proceedings of the WAKEFIELD FARMERS' CLUB, at the Meeting held April 5, 1849,

Resolved,—

"That the thanks of the Society be given to Mr. W. BARRATT, for his excellent Paper just read; and that two hundred copies be printed at the expense of the Club, and distributed gratis among the Members."

HENRY BRIGGS,
Hon. Sec.

AN INQUIRY

AS TO THE BEST MODE OF RENOVATING AND IMPROVING OLD PERMANENT PASTURES.

THE man who is uninterested in the fertility of the earth, is a man, either of a narrow and debased intellect, or of a selfish and ungenerous disposition. Not only is the human species dependant upon the cultivation of the soil for pleasures and luxuries, but also for "food and raiment;" and so absolutely is this the case that the arts of cultivation and the human race are found to be co-eval and commensurate, they rise or fall, flourish or decay together. We need not therefore be surprised, that in an age like ours when the spirit of change and improvement has seized upon government, upon commerce, upon mechanical arts, upon almost all the institutions and habits of men, that agriculture and its kindred occupations have shared to some extent the general changes.

This spirit of enterprise and improvement brought into agriculture, has resulted in many advantages. Innumerable, unfounded, and even ridiculous prejudices, which cramped and encumbered the industry of our forefathers, have been happily swept away. The chemical inquiries instituted respecting the food of plants have greatly improved the application of manures. The use of various newly invented machines and of other contrivances has diminshed human labours, or at least facilitated its application, and an employment once left to the *hinds and half wits* of our race has emerged into notoriety and grandeur—has called up the diligent inquiries of the philosopher and the man of science,—has obtained the immediate countenance and support of the peer and the prince.

But, as in politics, in trade, in architecture, in costume, and in a thousand other things, there may be change without advantage, and reform which leads only to ruin, so in agriculture without caution and without care we may innovate to our overthrow, and waste time, and strength, and money upon senseless or impossible improvements, until we have become the laughing stock of the nations. There is a certain caution and care required in *Agriculture* beyond every other human institution. Were the writer of these remarks to follow the bent of his own views and feelings upon this matter, he would be much more of a conservator of ancient wisdom and experience in *agriculture*, *horticulture*, and *pastoral* pursuits, than one carried away with modern innovation and experiments. Our forefathers were not *all* fools. The capability of making observations and the desire for improvement were not kept out of being until the nineteenth century. If the hills and the valleys, and the plains of our native island have been for so many ages in the hands of a sturdy race ; many a bright intellect has been employed in covering them with fertility and adorning them with beauty.

It was the counsel of the wise King of Israel " Remove not the ancient land mark," and in the spirit of this counsel we would say Take not away the ancient modes of tilling the land until it is indubitably certain that you have found a better.

These are principles which will not be lost sight of in our enquiry as to the best mode of improving and renovating Old Pastures.

The Grass Land of England has not received that care and attention its importance demands. According to the best statistical accounts, near half of the land is in pastures and meadows, the whole breadth of the land is estimated at about thirty-two and a half millions of acres, and more than fifteen millions of it is in grass—about ten and a half millions in arable and garden ground, and the remaining seven millions in *wastes*. The arable land has had considerable skill and attention bestowed upon it, and many and various and valuable books and papers have been written and printed upon it, whilst comparatively nothing has been done in the grass department; and yet from it is produced our beef and mutton, and great part of our clothing. It is very falacious to suppose that arable land gives a quicker or better return for capital expended or labour bestowed upon it, than upon grass land. Perhaps it is this error which makes persons so anxious to break up old grass land, and so reluctant to sow down permanent pastures; it is a fact, however, that the system of alternate grass lands produces a greater quantity of hay and green fodder than even the best of our old pastures; but yet where old pastures and meadows are under the best management they amply *remunerate*, as well as increase materially the produce of our country. The management of grass land must vary considerably in various localities and soils, but as general principles we venture to make the following observations.

First.—It is scarcely needful to observe that DRAINING lays at the foundation of improving a great proportion of the meadows and pastures of England. In ground requiring draining all other improvements must wait for full effect until the *surplus water* is got off by draining. It is not needful here to discuss the best and most proper modes of draining, as already so many excellent treatises are widely circulated; we may, however, here say that grasses are improved in quality, the quantity larger, and the variety of sorts increased by draining; as it very frequently happens that those lands which require draining are capable of producing the heaviest crops, as well as having a tendency to promote the healthiness of cattle and sheep grazing on them; and, here, let it not be forgotten, or overlooked, that some kinds of even porous soils, having a bad subsoil, which the roots of grasses do not like to enter, these are improved by draining, as then the rains, which fall, wash out more readily and freely a great proportion of the deleterious matter. In some cases it has been remarked that draining has done harm in grass land because it has destroyed some of the creeping and aquatic grasses, and caused those kinds left alive to grow strong as corn, but by judicious treatment this apparent evil, (for it is only apparent), can easily be remedied.

Second.—Fences in grass land claim a portion of our attention in this paper, particularly so, if the calculations on this subject are at all correct, *i.e.* that from three to seven per cent. of the whole surface is taken up with hedges and ditches. Of course persons who have large farms will be reluctant to admit this, but such is believed to be the fact. In many cases hedges have been permitted to grow wider and wider still, for ages past, some of them want only properly pruning to bring them to a proper width, height, and form, as they possess a sufficient number of thorn and other suitable plants to form a good *quick-hedge*; but on the other hand many want rooting out completely, being crooked and constituted principally of such kinds of plants as are wild in their growth, detrimental in their roots, and altogether unsuitable for fences. But where there are some good thorn plants, and the position of the hedge is right, the vacancies might be filled up with new thorns, taking the precaution first to prepare the land properly by throwing out the soil into the field, and replacing it with fresh soil from the field, for want of this care the thorn plants which are put in, (to fill up gaps as they are termed,) seldom thrive well; but, in other cases, the best plan is at once to root out the old hedge, trench well the ground two feet deep, and two to three feet wide—a good covering of manure will amply repay the expense—if in dry or well drained ground the bed may be prepared level with the surface of the natural soil, but in wet soils the bed for the hedge should be raised above the level of the natural soil, the height to vary according to circumstances, say from four to twelve inches. In bleak and cold situations a temporary shield, consisting of a low wall of stone or turf, or even a dead fence of boughs of beech, or fir, should be made to shelter the young hedge for a few years. These remarks go on the supposition that hedges are thought the best and most desirable of fences, this will appear obvious if economy in the extent of land, and neatness, beauty, and shelter for cattle be the considerations. In arable land a fence twenty inches wide at the bottom, three feet six inches high, and finishing at the top in a sharp ridge, but where shelter is wanted in grazing ground, the heights should vary from four to ten feet, and yet the bottom of the fence need never exceed two feet in breadth. Additional warmth will be rendered, especially in the Winter season, by a slight sprinkling of hollies plantedin the hedge.

Marshy pastures and meadows are often fenced by broad ditches, say from six to twelve feet wide, such fences as these are often undesirable, frequently partly filled with stagnant water, as well as rendering the pastures bleak and cold, both in winter and the spring. Walls may, in some cases, be indispensible; but, always, where neat clipped, or switched, thorn and holly fences can be obtained, they are most desirable. Much might be said of the best modes and seasons of cutting fences, but economy in ground, and shelter for cattle, are the points connected with my present subject.

Third.—The DESTRUCTION OF WEEDS in Grass land now demands our attention. I would not dwell on the great impropriety of allowing nettles, thistles, docks, and other strong growing and pernicious weeds to occupy (as is often the case) from three to ten feet wide round the fences, and in the corners of fields. Almost every person agrees that these should be rooted out; but such weeds as butter-cups, mosses, kexes, coltsfoot, growing in the open field, should be perseveringly destroyed. Thistles may be killed by mowing often, and still better by pulling up [by the roots, in wet weather, twice or thrice a year whilst they are in a free growing state; or, lastly, by dropping a little sulphuric acid on the crown of each plant after having the tops mown off. Rushes can only be effectually destroyed by draining. As soon as land is well drained, rushes immediately begin to disappear. Hassock, or Tussock, Grasses may be destroyed by salting them freely for two or three years successively. It induces the cattle to eat them closely down, which eventually kills them; or, by cutting them up with a strong hoe, then carting them off to rot, when they may be mixed with lime for tillage. Ranunculus acris, or what is generally called butter-cups, should be carefully rooted out with a strong hoe and burned. March is a suitable time for this operation. By some it is asserted that geese will destroy this plant, as they are very fond of its bulbous root. Kexes should be pulled off when in bloom, and by no means permitted to stand to ripen their seed. Farmers in the north say that by grazing land with sheep, as they are fond of the young kexe, they destroy it by repeatedly eating it down whilst young. Moss may be killed by harrowing freely, and afterwards applying a covering of lime and salt,—at the rate of a ton and half of lime with half a ton of salt per acre, taking care to mix them well together under a shed, and turning them over three or four times previous to being applied. And since I have named harrowing for destroying mosses, let it be distinctly understood than all Old Grass Lands should be well harrowed once a year for strong land, and once in two years for others of a lighter soil, but HARROW FREELY, don't be alarmed at the idea of tearing up a few grass plants. If the field is having manure or compost put on, put it on first, as it is the best time to harrow immediately after the manure is spread.

Fourth.—Sow on Fresh Seeds. When the foregoing operations have been performed, choose a dry time—about the middle of April—to sow the field over with Grass and Clover seeds. The quantity of seeds must be regulated by the extent of the vacant places in the field to be sown: the selections of kinds must be guided by the following various circumstances:—the quality of the soil, the situation whether hilly or flat (as it is found by experience and observation that some kinds of grasses flourish well on one side of a hill, which will not do so on the other: others do well on the flat ground, which would barely *exist* on the hills). Reference must also be made to the kinds at present growing, and their proportions, in order to supply suitable kinds which are yet lacking. Also care should be taken to ascertain whether the sorts of grasses growing are in proper proportions as to *early* and *late* kinds, and whether they are the *most nutritious* ones, if not those added may as easily be the desirable kinds as not, thereby considerably improving the pastures and meadows upon which they are sown. It must appear to every attentive observer that grass and hay from fields thus improved will be both better and in greater quantity, thereby remunerating for the expenses. If some seeds of the *vicia perrenis*, or the perrenial vetch were dibbled in at the rate of about four quarts per acre, it would be a very decided and lasting benefit.

Fifth.—ROLLING.—Many pastures and meadows are very seriously injured for want of WELL-ROLLING, the frost makes the top of the ground light, which raises up the smaller grass plants, (but especially in new laid down fields). Ant-hills and moles, to some degree raise the surface, and the disposition which some grasses manifest to grow in tufts, all have a tendency to make the surface light, but particularly uneven, thereby preventing the smaller grasses from growing; and, besides this, cattle and sheep cannot graze so closely in pastures, nor can the meadows be mown as closely as is desirable. When grass land *is* rolled, it is frequently just run over once, with a light roller, instead of being three, four, or five, or even more times rolled with a heavy stone, or iron roller, with three or four horses attached; so that they do not need to use strong exertions to drag the roller, if they do, their feet frequently do more harm than the roller can by possibility do good. Give grass plants a firm and closely pressed soil to grow in, and they will flourish, the blades of grass are more numerous and finer in their quality, beside being able to cut or graze it better. It would be a further improvement if the land could first be run over once or twice with Croskill's patent clod-crusher, and then rolled as above.

Sixth.—TILLING.—Composts consisting of rotted weeds, burnt clay or rubbish, ditchings, road-scrapings, and such like, mixed with bones, or lime, or salt, or guano, or nitrate of soda, &c., make excellent tillage for grass land. I need scarcely add that fold and stable manure, (when it can be had), is decidedly one of the best, if not *the* best, tillage that can be applied, where neither compost nor manure are at hand; then a dressing of hand tillages, such as bone dust, guano, salt, rock coombs, nitrate of soda, singeings from manufactories, and many other artificial manures, (so called), when they can be obtained *good.* IRRIGATION, even with pure water, vastly increases the produce in grass, but where water can be had that is impregnated with the refuse flowing from the sewers of a town or village, its productive properties is almost beyond calculation, the cost of this is the original outlay, in preparing the conduits, levelling the ground, and making drains to carry off the superfluous water. Thousands of acres might be easily irrigated in England, at a very moderate cost, as we cannot travel far without seeing large quantities of richly impregnated water passing away through our main ditches and sewers, into our canals and rivers, thereby losing what might have been used to advantage, in increasing the produce of our land, *to an amount we have never yet thought of.* But yet there remains an easy, economical, and a very effectual way of tilling grass land —by depasturing it with cattle and sheep. A judicious mixing of cattle and sheep is the most economical method, as where both graze in the same field the herbage is eaten up more closely, whereas, if one kind only are grazed in the field much of the herbage is left, and grows into rough hillocks, which are in a great measure waste, for, although they may be partially eaten up during the Winter season, they contain very little nutrition; let the plan of giving cake, at the rate of three or four pounds per day, to each head of cattle, and half a pound to a pound to each sheep, per day, for one season, and whether the beef or mutton repays the expense of the cake or not, the improved crops in future years is sure to do so; in fact, one of the greatest remunerative principles of farming *is* the sytem of manuring land, by means of eating as much of the produce *on* the ground as possible, and by adding cake to it, we improve many succeeding crops, without the enormous outlay of carting and spreading manure of other kinds. Where the plan is practicable, of changing the sheep and cattle from field to field, it gives time for the growth and sweetning of the grass in the field they have left, and prevents great loss in unnecessarily treading down the grass, by having the whole time to rove over the one field. I need scarcely add that amongst the various tillages LIQUID MANURE deserves serious thought, a prominent place, and a very widely extended application. Indeed, this subject is engrossing the attention of a *large* proportion of Agriculturists, as the belief is fast gaining ground that for want of collecting and applying the liquid from our stables, cow-houses, piggeries, and other conveniences, ***forty to fifty*** per cent of the manure of our country is lost.

There is yet another mode of tilling grass land, viz.,—by carting on to it Scotch and thousand headed cabbages, turnip tops, and when there is an abundant crop of turnips they may admit of one half being drawn to feed cattle and sheep, on bare and barren pastures; let these be applied in the proper localities of a field, such as the knoll of a hill, or where the soil is shallow, and the grass subject to burn up in summer, and the effects will be very visible for two or three years to come.

And now, gentlemen, having ventured to lay these remarks before you, I must request that they be received with the candour with which they have been submitted. It is a source of satisfaction to any one, discussing agricultural questions before this society, that he will not be allowed to speak as a dogmatist, but that the parties whom he addresses will reflect upon what is advanced, and only approve as their judgment approves. If any thing that has been advanced will contribute, in ever so small a degree, to illicit more of that capability in the soil of the earth, to furnish the means of human subsistance, (of which capability there seems to be no limit), our object will be gained.

We may be forgiven for adding that with skill, industry, and sobriety combined, the soil of England yet admits of a cultivation the world cannot surpass. It is not our business, at least, not now, to enquire into the policy of those extensive emigrations which are annually taking place; but so far as they imply a disparagement of our native soil, we unhesitatingly pronounce against them. The earth is yet grateful, and the man who labors to produce its fruits guided by knowledge, and sustained by industry, shall not labour in vain! It is not our design, indeed it is unworthy the honor of the land, to minister to the insatiate appetites of pride and vanity, by unseemly flattery heaped on the cultivators of the soil; but, on the other hand, it is but the indulgence of an honest exultation to rejoice at seeing them holding that rank in the scale of civil society which a true and enlightened policy has prepared for them—that rank is now secured by better and nobler defences than in ages gone by. The cultivator of the soil, true to the soil he cultivates, and true to himself, can no more be degraded. His green pastures and his fields "white to the harvest," are a true California to him—they bring him as much GOLD as he needs, and security and liberty to boot.

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